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**REMARKS**

In the Final Office Action of May 20, 2005, claims 1-13 are pending. Claims 1, 10-11, 13, and 14 are independent claims from which all other claims depend therefrom. Claim 14 is newly added.

In the Office Action of November 25, 2004, claims 1-2 and 7-8 were rejected under 35 U.S.C. 102(e) as being anticipated by Whight (US Publication No. 2001/0038670 A1), claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over Whight in view of Ushirokawa (USPN 6,535,554), claims 3-6 and 10-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Whight in view of Cioffi et al. (USPN 5,995,567). In the Response of November 15, 2004 Applicants provided arguments for the allowability of claims 1-13, which overcame the stated rejections. Applicants submit that the arguments presented remain valid. However, Applicants have herein amended claim 1 to further differentiate between the prior art and that claimed. Also, Applicants are herein responding to the arguments presented in section 6 of the current Office Action and in doing so are providing additional arguments for the allowability of claims 1-14.

Applicants, respectfully, request that the amendment to claim 1 be entered since it does not present new issues that would require further searching, especially in view of the limitations of the remaining claims that have already been searched and argued by the patent Office and are not herein amended. For example, the limitations of claim 11 recite an interference reference feedback signal formed via a digital processor and fed back to a second input.

In paragraphs 1 and 2 of section 6, with respect to claim 1, the Office Action states that Applicants are relying on features that are not recited in the claim. Specifically, the Office Action states that the use of an error signal as the interference reference signal is not claimed. Applicants submit that in the November Response Applicants did not argue for such a limitation, but rather argued the difference between the error signal of Whight and the interference

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reference feedback signal claimed. In the November Response Applicants stated that the error signal of Whight is not an interference reference feedback signal. The Applicants did not state that the claimed invention uses an error signal as an interference reference feedback signal. Applicants maintain that the error signal of Whight is not an interference reference signal. Applicants also submit that the claims ought to be interpreted in view of the specification. The specification clearly describes a circuit that is similar to Whight and that the claimed interference reference feedback signal claimed is clearly not the same as the desired signal 34 of the admitted prior art or the error signal 155 of Whight. To assert otherwise would be an improper interpretation of the claim and would clearly not be consistent or agreeable with the specification. Nevertheless, claim 1 has been amended to further distinguish it over Whight.

Due to the content of paragraphs 1 and 2 of section 6, Applicants assume that the above 102(e) rejection has been removed and that now claims 1-2 and 7-8 stand rejected under 103 U.S.C. 103(a) in view of Whight and Cioffi. In paragraphs 1 and 2, the Office Action appears to agree that Whight fails to teach or suggest the digital cancellation of interference, as recited in claim 1. The Office Action argues that Cioffi discloses such cancellation and thus combines the teachings of Cioffi with Whight.

Regardless of whether claim 1 is rejected in view of Whight alone or in view of Whight and Cioffi, claim 1 is herein amended to recite the limitations of adaptively canceling interference on the received signal using an interference reference feedback signal acquired downstream from a digital processor. This is clearly not taught or suggested by either reference alone or in combination. Whight does not suggest digital processing and clearly does not disclose a digital processor. Although Cioffi discloses a digital processor, Cioffi only discloses the feedback of an error signal that is precedent or upstream from a digital processor.

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Thus, both Whight and Cioffi fail to teach or suggest each and every element of claim 1, therefore, claim 1 is novel, nonobvious, and is in a condition for allowance.

Claim 14 recites similar limitations as that of claim 1, but instead of claiming the limitations of using an interference reference feedback signal acquired downstream from a digital processor, claim 14 recites the limitations of using an interference reference feedback signal and not using a non-feedback interference signal. Whight uses a non-feedback interference signal 135 and Cioffi uses a non-feedback interference signal  $v_c$ .

Thus, claim 14 is also novel, nonobvious, and is in a condition for allowance in view of Whight and Cioffi.

In paragraph 3 of section 6, the Office Action states, with respect to claim 10, that Whight teaches a method wherein said adaptively canceling interference further comprises digitally and accurately replicating the interference. The Office Action refers to Figure 1, page 2, section [0040], for such reliance. Applicants traverse and submit that they are unable to find any suggestion of digital cancellation in the stated section or anywhere else in Whight. In Figure 1A on page 2, Whight discloses the use of three sectors of vertically polarized electromagnetic signals that are analog signals, which are transmitted via a communication tower. In section [0040], Whight discloses the adjustment of phase of a counter interference signal in response to received interference reference signals. All signals described in section [0040] are analog based. The analog signals are sampled, correlated, and adjusted.

Claim 10 recites the limitations of A) correlating the interference reference feedback signal to the desired signal to generate an error signal and B) adaptively canceling interference on the received signal based on the error signal by generating the counter-interference signal to cancel the interference. Applicants submit that none of these limitations are taught or suggested by Whight or Cioffi alone or in combination.

With respect to limitation A, Whight discloses correlating an error signal 159 with an interference reference signal 135 to form a control signal

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157. The error signal 159 is a sample of the desired or output signal. The Office Action states that the error signal is an interference reference signal. If this were true then Whight would be correlating two interference reference signals, which again is not the correlation claimed. Nevertheless, the correlation of Whight does not produce an error signal, but rather a control signal. Also, the error signal of Whight is not digitally processed, as also required by claim 10. Cioffi does not provide a correlation. Thus, neither Whight nor Cioffi teach or suggest limitation A.

With respect to limitation B, Whight discloses canceling interference on the desired signal with interference based on the control signal 157. As stated the control signal 157 is not generated from an interference reference feedback signal and a desired signal, as claimed. The control signal 157 and the error signal claimed are clearly not the same. Since Cioffi fails to also provide the correlation claimed, Cioffi also fails to disclose the generation of a counter-interference signal generated in response to the error signal formed from the correlation claimed. Thus, neither Whight nor Cioffi teach or suggest limitation B.

In paragraph 4, with respect to claim 11, the Office Action states that Whight fails to teach a satellite payload circuit comprising a first input, a second input, and an output, said first input electrically coupled to said ADC, the satellite payload circuit digitally processing said received signal to form an interference reference feedback signal. Applicants agree. However, the Office Action states that Cioffi teaches a digital processor circuit 600 that digitally processes a received signal 108 to form an interference reference feedback signal  $v_D$ . Applicants traverse. One can readily see in reviewing Figure 6 of the circuit 600 that the digital processor 506 is downstream from the feedback signal or portion of the filtered output signal  $v_D$ . The received signal  $v_D$  is not digitally processed to form the filtered output signal  $v_D$ , but rather the output from the digital processor 506 is subtracted from the digital processor to form the filtered output signal  $v_D$ . Note the filtered output

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signal  $v_D$  is not an output of the digital processor 506, but rather is an input to the processor 506.

Applicants submit that Whight and Cioffi fail to teach or suggest the limitation of a feedback signal path electrically coupling said output to said second input, the feedback signal path transferring an interference feedback signal from the output to the second input. See Figure 3 of the present application the signal path from the output of the digital processor 76 to the second input 61b. Whight discloses the transfer of the error signal 155 to the correlator 153. The error signal is not transferred to the input 143. See Figure 2 of Whight. Cioffi discloses the transfer of the filtered output signal  $v_D$  from the output of the subtractor 602 to the digital processor 506. The filtered output signal  $v_D$  is not transferred to the input 110. See Figure 6 of Cioffi.

In paragraph 4 of section 6, the Office Action further states that Whight modified by Cioffi fails to teach the interference is within a satellite system. Applicants agree. However, the Examiner takes official notice that reducing interference in a satellite communication system is well known in the art. Applicants submit that regardless of whether reducing interference in a satellite is well known in the art, the claimed invention is not taught or suggested by the combination of Whight and Cioffi, the claimed invention was not known in the art prior to the claimed invention by the Applicants, and the claimed invention was not known or applied to a satellite system prior to the claimed invention by the Applicants.

Applicant further submits that Official Notice is being asserted by the Office Action without the use of documentary evidence to support the Examiner's conclusion. Referring to MPEP 2144.03, Office Notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known. The notice of facts beyond the record, which may be taken by the Examiner must be "capable of such instant and unquestionable demonstration as to defy dispute." *In re Ahlert*, 424 F.2d 1088, 1091, 165 USPQ 418, 420

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(CCPA 1970). Applicant submits that the limitations in question are not capable of such instant and unquestionable demonstration as to defy dispute. Specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. *Id.* at 1091, 165 USPQ at 420-21. Any facts so noticed should be of notorious character and serve only to "fill in the gaps" in an insubstantial manner. It is never appropriate to rely solely on common knowledge in the art without evidentiary support in the record as the principal evidence upon which a rejection was based. *Zurko*, 258 F.3d at 1386, 59USPQ2d at 1697 (Fed. Cir. 2001). The facts constituting the state of the art are normally subject to the possibility of rational disagreement among reasonable men and are not amendable to the taking of such notice. *In re Eynde*, 480 F.2d 1364, 1370, 178 USPQ 470, 474 (CCPA 1973). Ordinarily, there must be some form of evidence in the record to support an assertion of common knowledge. General conclusions concerning what is "basic knowledge" or "common sense" to one of ordinary skill in the art without specific factual findings and some concrete evidence in the record to support these findings will not support an obviousness rejection. *Lee*, 277 F.3d at 1344-45, 61 USPQ2d at 1434-35 (Fed. Cir. 2002).

The Examiner must provide specific technical and scientific reasoning to support his or her conclusion of common knowledge. *In re Soli*, 317 F.2d at 946, 37 USPQ at 801 (CCPA 1963). Applicant submits that no specific factual findings or concrete evidence has been put forth nor has any specific technical reasoning been put forth to support the Official Notice taken. To simply state that interference reduction is known in the art without support for the stated limitations and without evidence that the stated limitations have been utilized within a satellite is irrelevant and is not a proper or valid argument that can be used against the Applicant. Also, if Applicant challenges a factual assertion as not properly officially noticed or not properly based upon common knowledge, the Examiner must support the finding with adequate evidence. See 37 CFR 1.104(c)(2). Again Applicant submits that no such

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evidence has been provided to support a teaching or suggestion of the claimed elements.

In paragraph 5 of section 6, with respect to claim 13, the Office Action again states that Cioffi teaches a digital processor 506 that generates an interference reference feedback signal 512 from a desired signal 118. Applicants traverse. This is clearly not the case. Signal 512 is not a feed back signal, but is rather simply a signal that is transferred from the digital processor 506 to the subtractor 602. A feedback signal by definition is a return signal. A feedback signal has a starting point at an output along a series of one or more devices and is directed upstream. Signal 512 is not a return signal nor is it directed upstream. Also, note that the Office Action relies on signal 512 for disclosure of both the claimed counter-interference signal and the claimed interference reference feedback signal. Obviously, the two claimed signals are not the same identical signals, but rather are separate signals being transferred between different devices as claimed. One cannot rely on one particular signal for the disclosure of two clearly different claimed signals. Besides neither of the claimed signals are the same as the signal 512.

In paragraph 6 of section 6, with respect to claim 9, the Office Action states that Ushirokawa teaches a method of sequentially digitally canceling interference on a plurality of received signals. The Office Action refers to col. 18, lines 32-35 for such reliance. Applicants submit that in col. 18, lines 32-35 Ushirokawa discloses a latch and a sequential coupling device for coupling an output signal of an interference canceller to elements of a latch. The sequential coupling device disclosed does not and is not used to sequentially and digitally cancel interference on a plurality of received signals. The sequential coupling device is used to sequentially couple the phase rotation vector of multiple phase variation cancellers. Note that the sequential coupling device is downstream from the interference canceller 4, which has a single input and a single output. Also, note that the splitting of a single signal into multiple weighted signals occurs downstream from the interference canceller 4.

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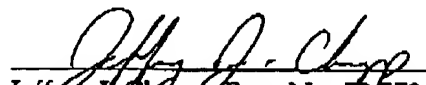
Regardless of whether Ushirokawa teaches a method of sequentially digitally canceling interference, it is clear that Ushirokawa, like Whight, fails to teach or suggest the digitally canceling of interference on a received signal within a satellite payload including adaptively canceling interference on the received signal using an interference reference feedback signal acquired downstream from a digital processor.

Thus, Applicants again submit that the relied upon art alone or in combination fails to teach or suggest each and every element of claims 1-14. Claims 1-14 are novel, nonobvious, and are in a condition for allowance.

In light of the amendments and remarks, Applicants submit that all the objections and rejections are now overcome. The Applicants have added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, he is respectfully requested to call the undersigned attorney.

Respectfully submitted,

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